

| Comment | Review Section: 4.Service Conditions |                         |      |           |      |   |   |  |  |
|---------|--------------------------------------|-------------------------|------|-----------|------|---|---|--|--|
| 1       | Name                                 | Affiliation             | Page | Subclause | Line | Comment   | Proposed Change   | Disposition Status<br>(accepted/rejected/revise)           | Disposition Detail   |
| 2       | Peter Zhao                           | Hydro One               | 5    | 4.1       | 30   | add 105°C maxi temp limit   | Add: and does not exceed 105°C maximum                                  | Zhao to work w. transformer committee to get clarification | Can't agree,   |
| 3       | Peter Zhao                           | Hydro One               | 13   | 4.1       | 31   | add temperature limit for bottom terminal connection, say, 105°C maxi temp            | Add: - The bottom terminal and lead connections do not exceed a 105 °C. | TBD  | status same as top terminal, need to consider transformer leads; who's responsible - bushing or transformer; how to measure; transformer guys don't measure - thermal scan not sensitive enough (no diff. 105 or 110C) |
| 4       | Peter Zhao                           | Hydro One               | 6    | 4.2.2     | 14   | add seismic conditions  | Add: or seismic conditions  | Accpeted/Revised   | Also to reference IEEE 693   |
| 5       | Ryan Musgrove                        | Oklahoma Gas & Electric | 5    | 4.1       | 31   | This line has the temperature measurement in K, while all other references are in °C. | For consistency, chance this temperature to 30°C                        | To seek IEEE clarification                                 |  |
| 6       | Ryan Musgrove                        | Oklahoma Gas & Electric | 5    | 4.1       | 32   | The dash on the dashed list appears to have been accidentally deleted                 |   | Editorial issue?   |  |

| Comment | 5. Rating    |                            |      |           |      |   |   |   |  |
|---------|--------------|----------------------------|------|-----------|------|---|---|---|--|
| 1       | Name         | Affiliation                | Page | Subclause | Line | Comment   | Proposed Change   | Disposition Status (accepted/rejected/revise) | Disposition Detail   |
| 2       | Shibao Zhang | PCORE Electric Company Inc | 8    | 5.4.1     |      | Thermal base rating to reflect C57.19.04 in last sentence   | To add "for the bushings used for enclosed bus duct or similar situation where the air temperature around the bushings exceeds the ambient temperature, reference to C57.19.04" | to further review                             | To work with C57.19.04 -to circulate 04 draft (already on website) |
| 3       | Shibao Zhang | PCORE Electric Company Inc | 8    | 5.4.2     |      | To be clearer about "draw-lead conductor"   | To change "draw-lead conductor" to "draw-lead conductor (rod or cable)"   | to revise                                     | to "draw-lead conductor (solid or cable)"                          |
| 4       | Scott Digby  | Duke Energy                | 7    | 5.3       |      | Add reference to C57.19.04.   | Change the phrase in parenthesis at the end of this section to (shown in Table 1 of IEEE Std C57.19.01 and Table 1 of C57.19.04).   |   |  |
| 5       | Scott Digby  | Duke Energy                | 7    |           |      | Add section to cover "Rated dry switching-impulse voltage" since C57.19.04 will reference this test and not the "Wet..." version of the test that is already included. [Note: I'll also be submitting a suggestion to add an applicable sub-clause within section 7.2 to describe the test, similarly to the "wet" version] | Add the section noted   |   |  |
| 6       | Scott Digby  | Duke Energy                | 7    | 5.4.1     |      | Add reference to C57.19.04 in the last paragraph of this section.   | Suggest adding the text "For bushings located within bus enclosures refer to C57.19.04 for requirements." at the end of the last paragraph of this section.                     |   |  |

| Comment | 7. Test Procedure |                            |      |           |                |   |   |   |                    |
|---------|-------------------|----------------------------|------|-----------|----------------|---|---|---|--------------------|
| 1       | Name              | Affiliation                | Page | Subclause | Line           | Comment   | Proposed Change   | Disposition Status<br>(accepted/rejected/revised) | Disposition Detail |
| 2       | Shibao Zhang      | PCORE Electric Company Inc | 11   | 7.1.2     | 1st point      | Mounting bushing for electrical tested in bushing factory could be different from real application; horizontally-mounted bushings may be also tested vertically for electrical purpose. | Change to "For electrical test, bushings shall be mounted on a supporting structure and with their ends in the media of the type in which the are intended to operate."                     |   |                    |
| 3       | Shibao Zhang      | PCORE Electric Company Inc | 13   | 7.2.2.2   |                | Horizontal bushings   | Too add "a bushing intended for horizontal mounting may be tested in vertical position as long as it can be demonstrated that effect of the bushing weight is considered during the tests". |   |                    |
| 4       | Shibao Zhang      | PCORE Electric Company Inc | 14   | 7.2.4     | f)             | change of ambient temperature affects the temperature   | To change "1°C" to "1K rise"  |   |                    |
| 5       | Shibao Zhang      | PCORE Electric Company Inc | 16   | 7.4.1     | 2nd paragraph  | C2 test is normally at 2 kV for bushings with voltage tap   | To change "10 kV" to "2 kV".  |   |                    |
| 6       | Shibao Zhang      | PCORE Electric Company Inc | 16   | 7.4.2     |                | bushing with no tap can be tested with UST as long as the flange is isolated  | At the end of 2nd paragraph, to add" the bushing may be also tested by the UST method when the bushing flange is isolated from the ground".   |   |                    |
| 7       | Shibao Zhang      | PCORE Electric Company Inc | 17   | 7.4.3     | Last paragraph | C57.12.90 still accept RIV test   | To delete last paragraph  |   |                    |

| Comment | 7. Incorporating 19.04 |             |      |           |      |  |   |   |                    |
|---------|------------------------|-------------|------|-----------|------|--|---|---|--------------------|
| 1       | Name                   | Affiliation | Page | Subclause | Line | Comment  | Proposed Change   | Disposition Status<br>(accepted/rejected/revised) | Disposition Detail |
| 2       | Scott Digby            | Duke Energy | 1    | 1.2       |      | Add reference to C57.19.04 within this section.  | Change the start of the 2nd sentence of this section to "See IEEE Std C57.19.01™ and C57.19.04™..."   |   |                    |
| 3       | Scott Digby            | Duke Energy | 2    | 2         |      | Add C57.19.04 as a normative reference (adding date once published).   | As stated in comment  |   |                    |
| 4       | Scott Digby            | Duke Energy | 6    | 4.2.2     |      | Reword the 6th item in the list of examples to reference C57.19.04   | Reword the 6th item as "Unusual temperature applications such as when located within bus enclosures (i.e., isophase or non-segmented bus duct, air terminal chamber). Refer to C57.19.04 for such service conditions. |   |                    |
| 5       | Scott Digby            | Duke Energy | 7    | 5.3       |      | Add reference to C57.19.04.  | Change the phrase in parenthesis at the end of this section to (shown in Table 1 of IEEE Std C57.19.01 and Table 1 of C57.19.04).   |   |                    |
| 6       | Scott Digby            | Duke Energy | 7    |           |      | Add section to cover "Rated dry switching-impulse voltage" since C57.19.04 will reference this test and not the "Wet..." version of the test that is already included.<br>[Note: I'll also be submitting a suggestion to add an applicable sub-clause within section 7.2 to describe the test, similarly to the "wet" version] | Add the section noted   |   |                    |
| 7       | Scott Digby            | Duke Energy | 7    | 5.4.1     |      | Add reference to C57.19.04 in the last paragraph of this section.  | Suggest adding the text "For bushings located within bus enclosures refer to C57.19.04 for requirements." at the end of the last paragraph of this section.   |   |                    |
| 8       | Scott Digby            | Duke Energy | 8    | 6         |      | Add reference to C57.19.04 within this section.  | Change the applicable text of the 2nd sentence of this section to "...or in IEEE Std C57.19.01™ and C57.19.04™ under corresponding headings."   |   |                    |
| 9       | Scott Digby            | Duke Energy | 10   | 7         |      | Add Dry switching-impulse withstand voltage to Table 2, with reference to new clause describing the test.  | As stated in comment  |   |                    |
| 10      | Scott Digby            | Duke Energy | 13   | 7.2.1     |      | Add section to describe "Dry switching-impulse withstand voltage" test.  |   |   |                    |